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EXAMINER	
NOGUEROLA, ALEXANDER STEPHAN	
ART UNIT	PAPER NUMBER
1753	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/889,243	MIYAZAKI ET AL.	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-44 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-44 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6,9 .	6) ☐ Other: .

Information Disclosure Statement

1. Although originally initialed, all the references on the IDS of July 13, 2001 have been crossed through because these references are also listed on the IDS of November 06, 2001.

Specification

2. The abstract must be 150 words or less. MPEP 608.01(a).

3. There should be a section containing a brief description of the drawings. MPEP 608.01(f).

Claim Objections

4. Claims 26 and 41 are objected to because of the following informalities:

a) the exponents are not clear due to bad printing. For example, is the second pressure value "3×10^{-1}" or "3×10^{-3}"?

b) Claim 41, line 15: "th'.

5. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. Claim 1-21 and 37-42 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted element is a detecting electrode (claim 2). Claim 1 is directed to a biosensor. The limitation of claim 2, which requires a detecting electrode, implies that the biosensor of claim 1 may not have a sensing (detecting) means and so would not be a biosensor.

7. Claims 2, 6, 14-16, 28-35, and 42-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention:

a) Claim 2: how is a working electrode different form a detecting electrode? In ordinary usage in the art they are the same;

b) Claim 14: there can only be one third slit. A second "third" slit is actually a fourth slit;

c) Claim 15 does not further structurally limit claim 14, but is only intended use; and

d) Claim 16: there can only be one fourth slit. Plural "fourth" slits are actually a fifth slit, a sixth slit; etc.;

e) Claims 28 and 33: nitrogen is not an inert gas (see a Periodic Table);

f) Claim 29 recites the limitation "conductive substances" in line 10. There is insufficient antecedent basis for this limitation in the claim;

g) Claim 30, line 8: what are "steams"?

h) Claim 34: "second" in "second vacuum chamber" implies another distinct vacuum chamber. How can two distinct entities be the same entity?

i) Claim 42, line 13: should "of" be -- to --?

j) Claim 42, line 16: is this line complete? It only states "the control part";

k) Claim 42, line 22; should "by" be -- when -- and should -- is -- be inserted before "provided"?

l) Claim 42, last line: after which applying step is the current measured?

m) Claim 43, line 10; should "by" be -- when -- and in line 11 should -- is -- be inserted before "provided"?

n) Claim 43, line 15: -- between – should be inserted between "as" and "the"

o) Claim 43, line 16: -- and the counter electrode – should be inserted between "electrode" and ";";

p) Claim 44; it is not clear what the user will be informed of. Will the user be informed only that no change occurs? and

r) Claim 44, line 2: no change in what?

8. Note that dependent claims will have the deficiencies of base and intervening claims.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

10. Claims 1, 2, 4, 8-11, 13-17, and 19-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Winarta et al. (US 6,287,451 B1).

Addressing claim 1, the Winarta et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (20) and a second insulating support (50);

an electrode part comprising at least a working electrode (W1) and a counter

electrode (R) ;

a specimen supply path for introducing the sample liquid to the electrode part (42); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 4, ln. 66 – col. 5, ln. 8);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 2),

the specimen supply path being provided on the electrode part (Figure 2), and the reagent layer being provided on the electrode part in the specimen supply path (col. 4, ln. 66 – col. 5, ln. 8), respectively, and

the electrode part being dividedly formed by first slits provided on the whole or part of an internal surface of one or both of the first insulating support and the second insulating support.

Addressing claim 2, a second working electrode (see the rejection of this claim under 35 U.S.C. 112, second paragraph, above) is shown in Figure 2.

Addressing claim 4, having the electrode part provided on the whole of the internal surface of only the first insulating support is shown in Figure 2.

Addressing claim 8, a spacer as claimed may be seen in Figure 2

Addressing claim 9, that the spacer and the support are to be integral may be seen from Figure 1.

Addressing claim 10, an air hole as claimed is shown in Figure 1 (element 52).

Addressing claim 11, how the reagent is applied (dripping) is a product-by-process limitation. Since the reagent will cover a portion of the electrodes the electrodes will be around a position where the reagent is located.

Addressing claim 13, more than two slits are shown in Figure 2.

Addressing claims 14 and 15, first and second insulating supports that are approximately parallel may be seen in Figure 2. Also shown is a third slit parallel with one side of the approximate rectangle shape. For claim 15 see the rejection under 35 U.S.C. 112, second paragraph, above.

Addressing claim 16, a fourth slit is shown in Figure 2. Note that the measuring device has not been claimed.

Addressing claim 17, using a laser to form the slits is taught in col. 7, ln. 54 – col. 8, ln. 6

Addressing claim 19, although not mentioned the depths of the slits must be at least equal the to the thickness of the electrical conductive layer other wise the electrodes will be in electrical contact and thus shorted.

Addressing claim 20, an enzyme is taught in col. 10, ll. 41-52.

Addressing claim 21, an electron mediator is taught in col. 10, ll. 41-52.

Addressing claim 22, a hydrophilic polymer is taught in col. 10, ll. 41-52.

Addressing claim 23, that the insulating layer is made of a resin material is taught in col. 5, ll. 37-44.

11. Claims 1-3, 8-11, 13-17, and 19-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Feldman et al. (US 6,299,757 B1).

Addressing claim 1, the Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or 540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

Addressing claim 2, a second working electrode (see the rejection of this claim under 35 U.S.C. 112, second paragraph, above) is disclosed in col. 31, ll. 42-44; col. 33, ll. 40-46; and col. 35, ll. 1-3.

Addressing claim 3, having a working electrode on the first substrate and a counter electrode on the second substrate may be seen in Figures 18A-C to 24A-C. Slits between electrodes are also shown in theses figures.

Addressing claim 8, a spacer as claimed may be seen in Figures 18 B – 24 B.

Addressing claim 9, that the spacer and the support are to be integral may be seen from Figure 6. Figures 18-24 are just different configurations of the embodiment shown in Figure 6. Additionally, obviously the biosensor parts shown in Figures 18-24 must be integrated in order to have a working biosensor.

Addressing claim 10, air holes as claimed are shown in Figures 18 B – 20B, 23 B, and 24 B, which show that the specimen supply path has an opening at each end.

Addressing claim 11, how the reagent is applied (dripping) is a product-by-process limitation. Since the reagent will cover a portion of the electrodes the electrodes will be around a position where the reagent is located.

Addressing claim 13, more than two slits are shown in Figures 19 and 20.

Addressing claims 14 and 15, first and second insulating supports that are approximately parallel may be seen in Figures 19 and 20. Also shown is a third slit parallel with one side of the approximate rectangle shape. For claim 15 see the rejection under 35 U.S.C. 112, second paragraph, above.

Addressing claim 16, a fourth slit is shown in Figures 19 and 20. Note that the measuring device has not been claimed.

Addressing claim 17, the Feldman et al. reference does not mention using a laser to form the slits. The electrodes are formed by "methods such as vapor deposition or printing" (col. 8, ll. 1-16 and col. 24, ll. 45-52). However, *how* the slits are made is a product-by-process limitation that does not materially distinguish the claimed invention over the Feldman et al. reference, unless a material structural or compositional difference is demonstrated.

Addressing claim 19, although not mentioned the depths of the slits must be at least equal the to the thickness of the electrical conductive layer other wise the electrodes will be in electrical contact and thus shorted.

Addressing claim 20, an enzyme is taught in col. 38, ll. 30-56.

Addressing claim 21, an electron mediator is taught in col. 38, ll. 30-65.

Addressing claim 22, a hydrophilic polymer is taught in col. 38, ll. 30-65.

Addressing claim 23, that the insulating layer is made of a resin material is taught in col. 26, ll. 26-27.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winarta et al. (US 6,287,451 B1) in view of Fujiwara et al. (US 6,309,526 B1).

The Winarta et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (20) and a second insulating support (50);

an electrode part comprising at least a working electrode (W1) and a counter electrode (R) ;

a specimen supply path for introducing the sample liquid to the electrode part (42); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 4, ln. 66 – col. 5, ln. 8);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 2),

the specimen supply path being provided on the electrode part (Figure 2), and the reagent layer being provided on the electrode part in the specimen supply path (col. 4, ln. 66 – col. 5, ln. 8), respectively, and

the electrode part being dividedly formed by first slits provided on the whole or part of an internal surface of one or both of the first insulating support and the second insulating support.

Although the Winarta et al. reference does not specifically mention that the counter electrode and the detecting electrode have the same area as the working electrode this is arguably implied by the Winarta et al. reference because it states that the counter electrode may have the same size as the working electrode (col. 4, ll. 48-53). In any event, the Fujiwara et al. reference teaches a biosensor comprising a first substrate and a second substrate, a working electrode and counter electrodes on the first substrate, a specimen supply path, and reagent in the specimen supply pathway (the abstract and Figures 1(d) and 2), with the counter electrodes [and presumably electrodes other than the working electrode] identical or larger then the working electrode (col. 3, ll. 1-14). It would have been obvious to one with ordinary skill in the art at the time the invention was made to have the counter electrodes and detector electrode equal to or larger than that of the working electrode as taught by the Fujiwara et al. reference in the invention of the Winarta et al. reference because as taught by the Fujiwara et al. reference such a relative electrode area will improve performance (col. 3, ll. 10-14).

For claim 6 note that if the area of the counter electrode is larger than that of the working electrode than the total area of the counter electrode and the detecting electrode must be larger than that of the working electrode.

16. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Winarta et al. (US 6,287,451 B1) in view of Sugihara et al. (US 6,132,683) and Pace (US 4,225,410).

The Winarta et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (20) and a second insulating support (50);

an electrode part comprising at least a working electrode (W1) and a counter electrode (R) ;

a specimen supply path for introducing the sample liquid to the electrode part (42); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 4, ln. 66 – col. 5, ln. 8);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 2),

the specimen supply path being provided on the electrode part (Figure 2), and the reagent layer being provided on the electrode part in the specimen supply path (col. 4, ln. 66 – col. 5, ln. 8), respectively, and

the electrode part being dividedly formed by first slits provided on the whole or part of an internal surface of one or both of the first insulating support and the second insulating support.

Although the Winarta et al. reference does not specifically mention the counter electrode and the detecting electrode having the same area this is arguably implied by the Winarta et al. reference because it states that the counter electrode may have the same size as the working electrode (col. 4, ll. 48-53). In any event, choosing the relative areas of the different electrodes is just a matter of optimizing the biosensor. As shown by the Sugihara et al. reference and the Pace reference it was known at the time of the invention that the relative sizes of the different electrodes will affect the reliability and accuracy of a biosensor (in the Sugihara et al. reference see col. 2, ll. 53-67 and in the Pace reference see col. 8, ll. 57-62).

17. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Winarta et al. (US 6,287,451 B1) in view of Haruhiro et al. (JP 06109688 A).

The Winarta et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (20) and a second insulating support (50);

an electrode part comprising at least a working electrode (W1) and a counter electrode (R);

a specimen supply path for introducing the sample liquid to the electrode part (42); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 4, ln. 66 – col. 5, ln. 8);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 2),

the specimen supply path being provided on the electrode part (Figure 2), and the reagent layer being provided on the electrode part in the specimen supply path (col. 4, ln. 66 – col. 5, ln. 8), respectively, and

the electrode part being dividedly formed by first slits provided on the whole or part of an internal surface of one or both of the first insulating support and the second insulating support.

The Winarate et al. reference does not mention an arc-shaped second slit, although it does show a second slit that has a bend (Figure 2). The Haruhiro et al. reference teaches an arc-shaped second space between electrodes in a biosensor. It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide an arc-shaped space

between electrodes as taught by the Haruhiro et al. reference, that is, use the electrode configuration of the Haruhiro et al. reference, in the invention of the Winarata et al. reference because as taught in the abstract of the Haruhiro et al. reference the measurement accuracy will be improved.

18. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Winarta et al. (US 6,287,451 B1).

The Winarta et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (20) and a second insulating support (50);

an electrode part comprising at least a working electrode (W1) and a counter electrode (R) ;

a specimen supply path for introducing the sample liquid to the electrode part (42); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 4, ln. 66 – col. 5, ln. 8);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 2),

the specimen supply path being provided on the electrode part (Figure 2), and the reagent layer being provided on the electrode part in the specimen supply path (col. 4, ln. 66 – col. 5, ln. 8), respectively, and

the electrode part being dividedly formed by first slits provided on the whole or part of an internal surface of one or both of the first insulating support and the second insulating support.

Also, using a laser to form the slits is taught in col. 7, ln. 54 – col. 8, ln. 6

The Winarta et al. reference does not mention widths for the slits, although it does state that the slit is very thin (col. 10, ll. 3-7). Barring evidence to the contrary, such as unexpected results, the width of the slits is a matter of optimization. The closer the electrodes are together the smaller required size for the biosensor and the smaller sample volume that can be accommodated. On the other hand the slit width is limited by the capability and accuracy of the means for making the slit. At smaller slit width inaccuracy is more likely and electrodes may actually contact each other in some spots, thus creating a short.

19. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Winarta et al. (US 6,287,451 B1) in view of the Derwent listing for Miyo Shinku Kogyo (JP 60007191 A) and Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo (JP 60007191 A).

The Winarta et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (20) and a second insulating support (50);

an electrode part comprising at least a working electrode (W1) and a counter electrode (R) ;

a specimen supply path for introducing the sample liquid to the electrode part (42); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 4, ln. 66 – col. 5, ln. 8);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 2),

the specimen supply path being provided on the electrode part (Figure 2), and the reagent layer being provided on the electrode part in the specimen supply path (col. 4, ln. 66 – col. 5, ln. 8), respectively, and

the electrode part being dividedly formed by first slits provided on the whole or part of an internal surface of one or both of the first insulating support and the second insulating support.

Although the Winarta et al. reference teaches vapor deposition for forming the electrodes (col. 4, ll. 15-20) it does not mention roughening the insulating surface first. The Derwent listing for Miyo Shinku Kogyo and Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo teach roughening the surface of an insulating support before forming an electrode on the insulating support. It would have been obvious to one with ordinary skill in the art at the time the invention was made to roughen the surface of the insulating support because as taught by Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo in the invention of the Winarta et al. reference because this will increase the adhesion between the electrode and the insulating support.

20. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. (US 6,299,757 B1) in view of Fujiwara et al. (US 6,309,526 B1).

The Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or 540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

The Feldman et al. reference does not specifically mention that the counter electrode and the detecting electrode have the same area as the working electrode. The Fujiwara et al. reference teaches a biosensor comprising a first substrate and a second substrate, a working electrode and counter electrodes on the first substrate, a specimen supply path, and reagent in the specimen supply pathway (the abstract and Figures 1(d) and 2), with the counter electrodes [and presumably electrodes other than the working electrode] identical or larger then the working electrode (col. 3, ll. 1-14). It would have been obvious to one with ordinary skill in the art at the time the invention was made to have the counter electrodes and detector electrode equal to or larger than that of the working electrode as taught by the Fujiwara et al. reference in the invention of the Feldman et al. reference because as taught by the Fujiwara et al. reference such a relative electrode area will improve performance (col. 3, ll. 10-13).

For claim 6 note that if the area of the counter electrode is larger than that of the working electrode than the total area of the counter electrode and the detecting electrode must be larger than that of the working electrode.

21. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. (US 6,299,757 B1) in view of Fujiwara et al. (US 6,309,526 B1).

The Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or 540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

The Feldman et al. reference does not specifically mention that the counter electrode and the detecting electrode have the same area. However, choosing the relative areas of the different electrodes is just a matter of optimizing the biosensor. As shown by the Sugihara et al. reference and the Pace reference it was known at the time of the invention that the relative sizes of the different electrodes will affect the reliability and accuracy of a biosensor (in the Sugihara et al. reference see col. 2, ll. 53-67 and in the Pace reference see col. 8, ll. 57-62).

22. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. (US 6,299,757 B1) in view of Haruhiro et al. (JP 06109688 A).

The Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or 540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

The Feldman et al. reference does not mention an arc-shaped second slit, although it does show a second slit that has a bend (Figures 18-20 and 22-24). The Haruhiro et al. reference teaches an arc-shaped second space between electrodes in a biosensor. It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide an arc-shaped space between electrodes as taught by the Haruhiro et al. reference, that is, use the electrode configuration of the Haruhiro et al. reference, in the invention of the Feldman et al. reference because as taught in the abstract of the Haruhiro et al. reference the measurement accuracy will be improved.

23. Claims 18 and 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. (US 6,299,757 B1).

Addressing claim 18, the Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or 540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference

that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

The Feldman et al. reference does not mention using a laser to form the slits. The electrodes are formed by "methods such as vapor deposition or printing" (col. 8, ll. 1-16 and col. 24, ll. 45-52). However, *how* the slits are made is a product-by-process limitation that does not materially distinguish the claimed invention over the Feldman et al. reference, unless a material structural or compositional difference is demonstrated.

The Feldman et al. reference does not mention widths for the slits, although a very thin slit is implied since the sample volume will be very small (col. 7, ll. 50-55). Barring evidence to the contrary, such as unexpected results, the width of the slits is a matter of optimization. The closer the electrodes are together the smaller required size for the biosensor and the smaller sample volume that can be accommodated. On the other hand the slit width is limited by the capability and accuracy of the means for making the slit. At smaller slit width inaccuracy is more likely and electrodes may actually contact each other in some spots, thus creating a short.

Addressing claim 38, the Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or

540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

Although the Feldman et al. reference does not mention a first voltage application step and a first change detecting step for detecting sample liquid in the sample chamber, these steps it

would have been obvious to one with ordinary skill in the art at the time the invention was made to perform these steps because the Feldman et al. reference teaches measuring current to determine if the sample camber has been filled (col. 51, ll. 1-36).

Addressing claim 39, the Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or 540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to

Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

Although the Feldman et al. reference does not mention a first voltage application step a first change detecting step, and a second change detecting step for detecting sample liquid in the sample chamber, these steps it would have been obvious to one with ordinary skill in the art at the time the invention was made to perform these steps because the Feldman et al. reference teaches using signals generated from among three electrodes to determine if the sample camber has been filled (col. 51, ll. 1-36).

Addressing claim 40, it would have been obvious to one with ordinary skill in the art at the time the invention was made to perform a no-change informing step as claimed in the invention of the Feldman et al. reference because this reference teaches providing a signal to the user of the fill status of the sample chamber (col. 51, ll. 1-12 and col. 52, ll. 14-17).

Addressing claim 41, the Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or

540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

Although the Feldman et al. reference does not mention a first switch for essentially switching between a mode for detecting sample filling of the sample camber and a mode for

actually making measurements on the sample, such a switch is implied because the Feldman et al. reference teaches using at least three electrodes to determine if the sample chamber has been filled and then to making measurements on the sample (col. 51, ll. 1-36).

24. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman et al. (US 6,299,757 B1) in view of the Derwent listing for Miyo Shinku Kogyo (JP 60007191 A) and Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo (JP 60007191 A).

The Feldman et al. reference teaches a biosensor for quantifying a substrate included in a sample liquid comprising

a first insulating support (508 or 528 or 548 or 568 or 583 or 648 or 608 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively) and a second insulating support (500 or 520 or 540 or 562 or 579 or 640 or 600 Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively);

an electrode part comprising at least a working electrode (502, 522, 542, 562, 580, 642, 602 in Figures 18A, 19A, 20A, 21A, 22A, 23A, and 24A, respectively) and a counter electrode (510, 512; 530, 532, 534; 550, 552, 554; 570, 572; 584, 585; 650, 652, 654; 610, 612 in Figures 18C, 19C, 20C, 21C, 22C, 23C, and 24C, respectively);

a specimen supply path for introducing the sample liquid to the electrode part (514, 526, 546, 566, 582, 646, 606 in Figures 18B, 19B, 20B, 21B, 22B, 23B, 24B, respectively); and

a reagent layer employed for quantifying the substrate included in the sample liquid

(col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer can be employed for the cited embodiments);

the electrode part, the specimen supply path, and the reagent layer existing between the first insulating support and the second insulating support (Figure 18 A-C to Figure 24 A-C),

the specimen supply path being provided on the electrode part (Figure 18 A-C to Figure 24 A-C), and the reagent layer being provided on the electrode part in the specimen supply path (col. 31, ll. 30-33 and col. 32, ln. 65 – col. 33, ln. 15; it is clear from the reference that the reagent layer will be provided in the specimen supply path for the cited embodiments), respectively, and

the electrode part being dividedly formed by first slits provided on the whole of an internal surface of the first insulating support (Figure 18 A-C to Figure 24 A-C).

Although the Feldman et al. reference teaches vapor deposition for forming the electrodes (col. 32, ll. 1-6) it does not mention roughening the insulating surface first. The Derwent listing for Miyo Shinku Kogyo and Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo teach roughening the surface of an insulating support before forming an electrode on the insulating support. It would have been obvious to one with ordinary skill in the art at the time the invention was made to roughen the surface of the insulating support as taught by Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo in the invention of the Feldman et al. reference because this will increase the adhesion between the electrical conductor and the insulating support.

25. Claims 24-29 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Derwent listing for Miyo Shinku Kogyo (JP 60007191 A) and Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo (JP 60007191 A).

Addressing claims 24 and 34, The Derwent listing for Miyo Shinku Kogyo teaches that the Miyo Shinku Kogyo patent discloses a printed circuit board forming method. Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo further teaches that the Miyo Shinku Kogyo patent discloses a roughened surface forming step of roughening the surface of the insulating support by colliding an excited gas against the surface of the insulating support in a vacuum atmosphere, and an electrical conductive layer forming step of forming the electrical conductive layer which is composed of a conducive substance on the roughened surface of the insulating support.

Neither the Derwent listing for Miyo Shinku Kogyo nor Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo specifically mention that the electrical conductive layer will be used as an electrode. It would have been obvious to one with ordinary skill in the art at the time the invention was made that the electrical conducive layer will be used as an electrode because this is implied from the Derwent listing for Miyo Shinku Kogyo, which teaches that the invention concerns forming a printed circuit board. Also, although a thin film electrode is not specifically mentioned by either reference this is also implied as, again, a printed circuit board is to be produced and the electrical conductive layer will be formed by sputtering.

Addressing claim 25, the limitations of this claim are necessary or implied by the cited references. For example, the insulating support must be placed in the vacuum chamber before

excited gas can be collided against it in the vacuum chamber and the vacuum chamber must be evacuated in order to create a vacuum in the vacuum chamber.

Addressing claims 26 and 31, the Derwent listing for Miyo Shinku Kogyo as modified by Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo teaches creating a vacuum of 3 x 10^{-3} Torr in the vacuum chamber. However, barring evidence to eh contrary, the extent of the vacuum is just a mater of optimizing operating parameters.

Addressing claims 27, 28, 32, and 33, the Derwent listing for Miyo Shinku Kogyo as modified by Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo teaches using argon gas.

Addressing claim 29, the limitations of this claim essentially provide for a second vacuum chamber for sputtering the electrical conductive layer. The Derwent listing for Miyo Shinku Kogyo as modified by Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo does not mention a separate vacuum chamber for forming the electrical conductive layer. However, this is merely optimizing the circuit board production apparatus. The steps of cleaning and coating will require substantially different conditions and parameters, such as gas used and pressure. So it will be more efficient to have a separate vacuum chamber for the cleaning and coating steps. This way, a recently cleaned insulating substrate can be coated while another insulating substrate is being cleaned. Note that the cited references teach sputtering, which involves beating atoms out of a substance with a colliding gas.

Addressing claim 35, noble metals are well known conducing substances used in electrodes. Barring evidence to the contrary, such as unexpected results, the choice of conducting substance will depend on desired conductivity, desired corrosion resistance, and cost limit.

26. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Derwent listing for Miyo Shinku Kogyo (JP 60007191 A) and Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo (JP 60007191 A) as applied to claims 24-29 and 31-35 above, and further in view of Drummond et al. (US 5,863,400).

The Derwent listing for Miyo Shinku Kogyo (JP 60007191 A) as modified by Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo does not mention t thickness for the formed film. However, barring evidence to the contrary, such as unexpected results, having a thickness for the formed film within Applicant's claimed range is just a matter of optimizing the electrode for its intended use. For example, the Drummond et al. reference teaches sputtered electrodes between 10-200 nm in thickness (col. ll. 9-22). Smaller electrode dimensions allow for a smaller circuit and thus a more compact device.

Allowable Subject Matter

27. Claims 30 and 42-44 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

28. The following is a statement of reasons for the indication of allowable subject matter:

a) Claim 30 essentially requires vapor deposition of the conductive substance. The Derwent listing for Miyo Shinku Kogyo as modified by Applicant's *Concise Statement of Relevancy* of Miyo Shinku Kogyo only discloses sputtering a conductive substance;

b) Claim 42 requires a second A/D conversion circuit and the step of connecting the selector switch to ground. These features are not disclosed by the cited prior art; and

c) Claims 43 and 44 depend from allowable claim 42.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (703) 305-5686. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Alex Noguerola
Alex Noguerola
9/22/03
Primary Examiner
TC 1700